

**CLAIMS**

1. A method of producing a microstructured optical fibre from a preform, said method including the steps of:
  - 5 creating zones of relatively high refractive index at predetermined locations in said preform, said zones substantially surrounded by material of relatively low refractive index to create an array of light guiding cores, and
  - 10 subsequently drawing said preform to create a length of said microstructured optical fibre.
- 15 2. The method as claimed in claim 1 wherein said light guiding cores are surrounded substantially by air.
3. The method as claimed in claim 1 or 2 wherein said light guiding cores have a generally non-circular cross-sectional shape.
4. The method as claimed in any one of claims 1 to 3 wherein said preform is formed from optically suitable polymeric material.
- 15 5. The method as claimed in any one of claims 1 to 3 wherein a plurality of holes is drilled into said preform at said predetermined locations.
6. The method as claimed in any one of claims 1 to 5 wherein said preform is drawn to form said microstructured optical fibre in a two-stage drawing process.
7. A method of producing a microstructured optical fibre from a preform, said
- 20 method including the steps of:
  - creating channels of relatively low refractive index at predetermined locations in said preform, said channels acting to define light guiding cores, and
  - 15 subsequently drawing said preform to create a length of said microstructured optical fibre.
- 25 8. The method as claimed in claim 7 wherein a plurality of holes is drilled into said preform at said predetermined locations to create said channels.
9. The method as claimed in claim 7 or 8 wherein said preform is drawn to form said microstructured optical fibre in a two-stage drawing process.
10. The method as claimed in any one of claims 7 to 9 wherein said preform is
- 30 monolithic.

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11. A micro-structured optical fibre, said optical fibre including a plurality of air channels, said air channels acting to define light guiding cores between said air channels.
12. A micro-structured optical fibre for imaging applications, said optical fibre including air channels which act as light guiding cores.